WESTERN POWER DISTRIBUTION

Serving the Midlands, South West and Wales

Distribution Future Energy Scenarios 2021

Stakeholder consultation webinar summary report

West Midlands licence area

westernpower.co.uk

WESTERN POWER DISTRIBUTION
Serving the Midlands, South West and Wales

Future Energy Scenarios

DFES 2021 stakeholder consultation webinar summary report

Scope of this report
This summary report collates the results of four stakeholder consultation webinars, run by Regen and Western Power Distribution (WPD) as part of the 2021 Distribution Future Energy Scenarios (DFES) project. We have presented the stakeholder comments and questions, as well as the results of the questions we asked of the stakeholders. These results have been grouped by theme from across the four webinars, preceded by a summary of the webinar stakeholders and links to further reading.

DFES Project summary
DFES is a key aspect of WPD's strategic network investment planning. Regen has been commissioned to undertake the 2021 round of DFES analysis for the four WPD licence areas (South West, South Wales, East Midlands, and West Midlands). The project models the uptake and deployment of renewable, low carbon and fossil fuel power generation, energy storage, low carbon heating technologies, electric vehicles, and hydrogen electrolysers at a high geographical granularity, as well as analysing planned housing and commercial developments. The modelling is informed throughout by detailed local and regional contextual factors and stakeholder feedback, which will help WPD to plan strategically and invest appropriately in the electricity network.

Towards net zero
Each region in Great Britain has unique characteristics and resources, and so as part of the transition to net zero each region will see unique deployment levels of renewable and low carbon technologies. The DFES analyses the National Grid ESO Future Energy Scenarios (FES) and assesses the deployment of these various technologies at a granular level for each of WPD's licence areas. The analysis looks at dozens of specific local factors such as local plans, renewable energy resources, agricultural land, housing density and public transport provision. The scenarios encompass three potential net zero pathways and one non-compliant pathway that form the National Grid ESO FES 2021.

Stakeholder engagement
A key part of DFES is engagement and consultation with local stakeholders. This includes local government, project developers, technology installers and local/community energy groups. Regen engages these stakeholders via online workshops, as summarised in this report, as well as via more targeted consultations with project developers, asset owners and other relevant industry representatives. In addition to this, Regen engages every local authority to understand local energy strategies, climate ambitions and planned housing and commercial developments.

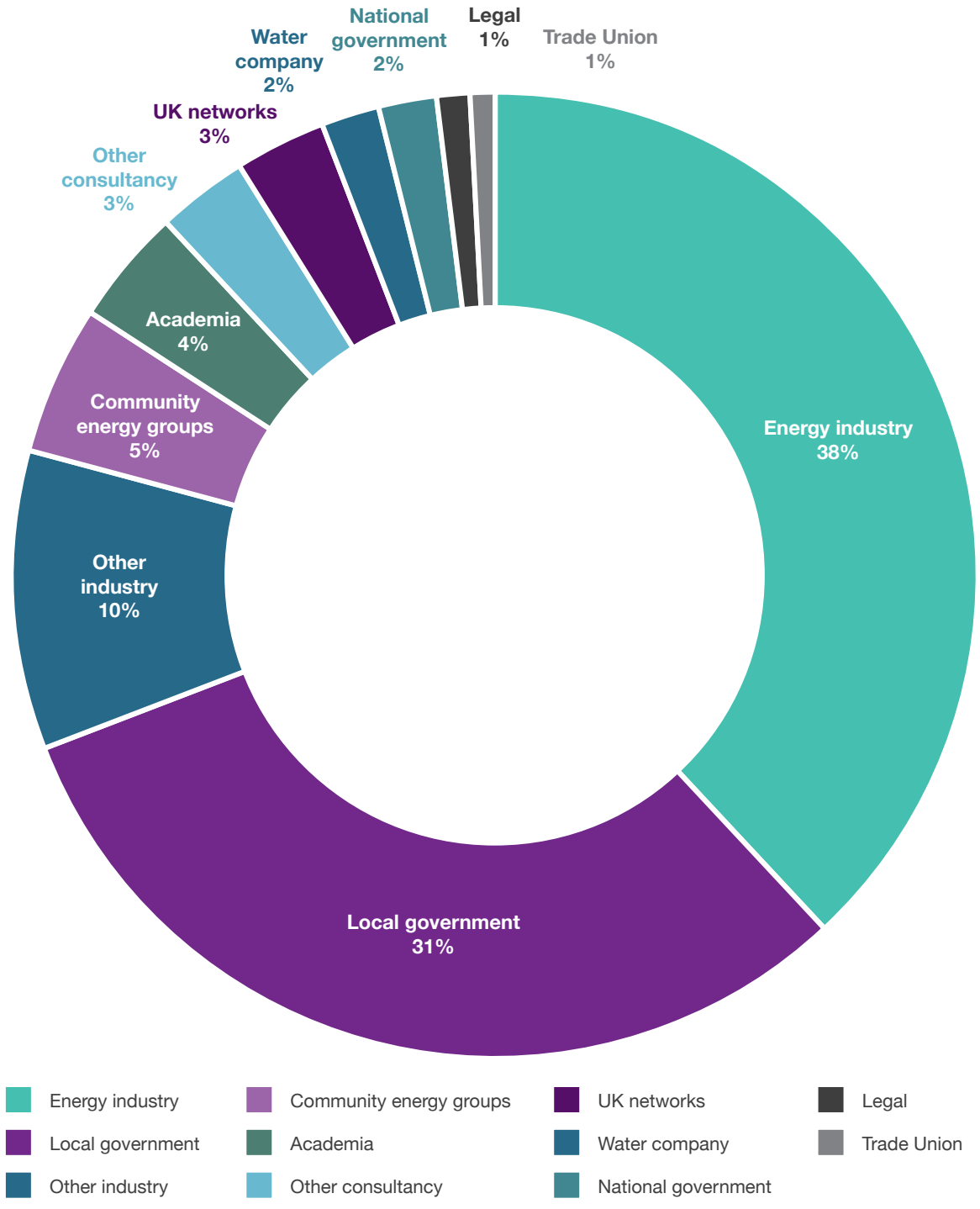
To find out more information or you have any questions about the webinars or the DFES project, please contact:

wpdnetworkstrategy@westernpower.co.uk

Stakeholders

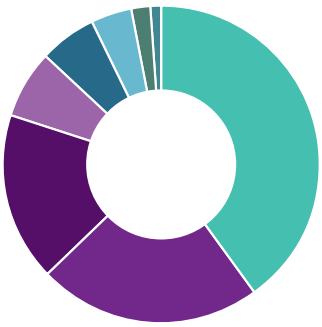
The sectors represented by the stakeholders that attended one or more of the four webinars are shown in **Figure 1** and are also shown by individual region. Delegates from the energy industry and local government made up the majority of registrations for each webinar, with varying levels of representation from community energy groups, academia, energy distribution and transmission networks and non-energy industries, such as house builders, technology companies and landowners.

Figure 1
Registrants for all four WPD DFES consultation webinars.



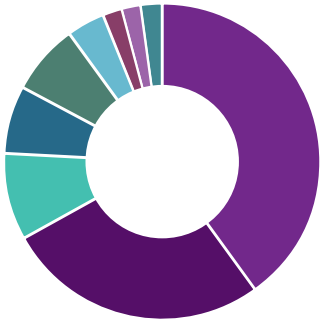
WESTERN POWER DISTRIBUTION
Serving the Midlands, South West and Wales

South West webinar



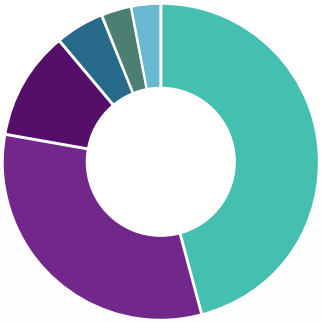
- **40%** Energy industry
- **23%** Local government
- **17%** Other industry
- **7%** Community energy groups
- **6%** Other consultancy
- **4%** Water company
- **2%** Academia
- **1%** Legal

South Wales webinar



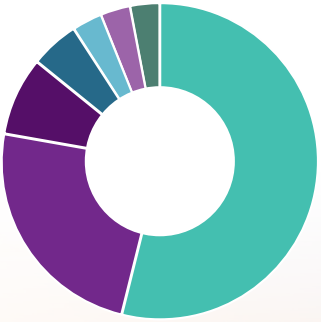
- **40%** Energy industry
- **27 %** Local government
- **9%** Academia
- **7%** Community energy groups
- **7%** National government
- **4%** Other industry
- **2%** Other consultancy
- **2%** Water company
- **2%** UK networks

West Midlands webinar



- **46%** Energy industry
- **32%** Local government
- **11%** UK networks
- **5%** Other industry
- **3%** Water company
- **3%** Trade union

East Midlands webinar



- **54%** Local government
- **24%** Energy industry
- **8%** Other industry
- **5%** Academia
- **3%** Other consultancy
- **3%** UK networks
- **3%** Community energy groups

West Midlands

DFES stakeholder consultation webinar summary report

Audience survey result

4.3 average rating

Date: **29 June 2021**
Attendees: **44 (including panellists)**
WPD contact: **wpdnetworkstrategy@westernpower.co.uk**
Regen contact: **jhaynes@regen.co.uk**
A link to the agenda and recordings is available at the Regen website.

The purpose of the webinar was to communicate to stakeholders in the West Midlands licence area an overview of the DFES process, what the project outcomes would look like and how they may feed into and access the data. Stakeholder participation was also facilitated, and responses were sought on the near term factors impacting the uptake rate and spatial distribution of low carbon technologies, and how the unique characteristics of the licence area region would impact these.

Oli Spink, Network Strategy Engineer at Western Power Distribution, presented an overview of the DFES process and a summary of how the DFES data is used to inform where and when strategic network reinforcement may be needed under a specific scenario. Oli also outlined how the DFES process is linked to the Local Area Energy Planning (LAEP) process.

The current WPD DFES interactive map is available to explore here:
www.westernpower.co.uk/distribution-future-energy-scenarios-map

Jonty Haynes, Senior Analyst at Regen, presented the energy generation context for the West Midlands, showing where and when renewable generators had connected to the WPD network. This analysis is used in the DFES process to inform and calibrate the spatial distribution of different generation technologies. The regional deployment history of ground mounted solar PV was presented alongside the much larger near term pipeline, with stakeholders inputting feedback on the potential near term deployment of these key renewable technologies.

Grace Millman, Energy Analyst at Regen, then presented information on fossil fuelled generation and electricity storage assets connecting to WPD's West Midlands network, with stakeholders feeding into various questions on current diesel fuelled generation, hydrogen production through electrolysis, and energy storage.

Domestic scale technologies were also covered, with the current location of heat pumps and resistive electric heating presented to stakeholders, followed by questions on the uptake of heat pumps in the near term, as the UK government looks to ramp up deployment, and the role of resistive electric heating in a net zero world. The current uptake of electric vehicles and chargers was also detailed, with a question about the potential solutions to on-street charging.

The final presentation covered how Regen account for new housing and business space through consultation with local authorities, and how the modelling aims to reflect local variation and ambition, such as climate emergency declarations. Stakeholders were asked to identify key areas the climate declarations may impact.

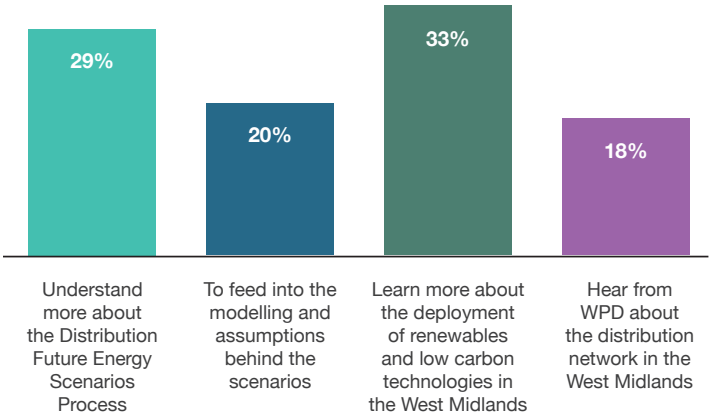
The webinar concluded with a question-and-answer session with all of the panellists. The questions, comments, and discussion points are summarised in the next section of this report, categorised by theme, with a summary of how the input and feedback from the webinar will be used in the DFES modelling going forward.

Initial feedback

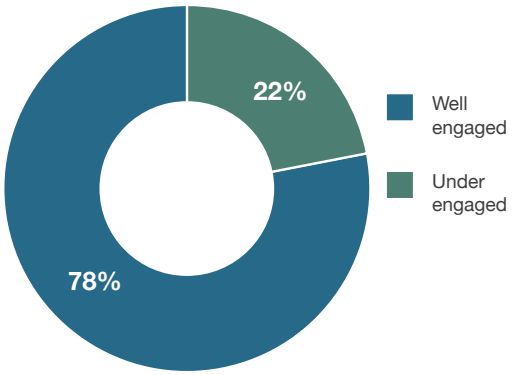
At the beginning of the webinar, we asked stakeholders if they were previously aware of the WPD DFES process, whether they felt well engaged, under engaged or over engaged, and how well they understood the relationship between national Future Energy Scenarios, DFES, and Local Area Energy Planning.

The results of these questions are shown below. We also asked a free-form question around what further DFES publications would be useful in addition to the current suite of outputs.

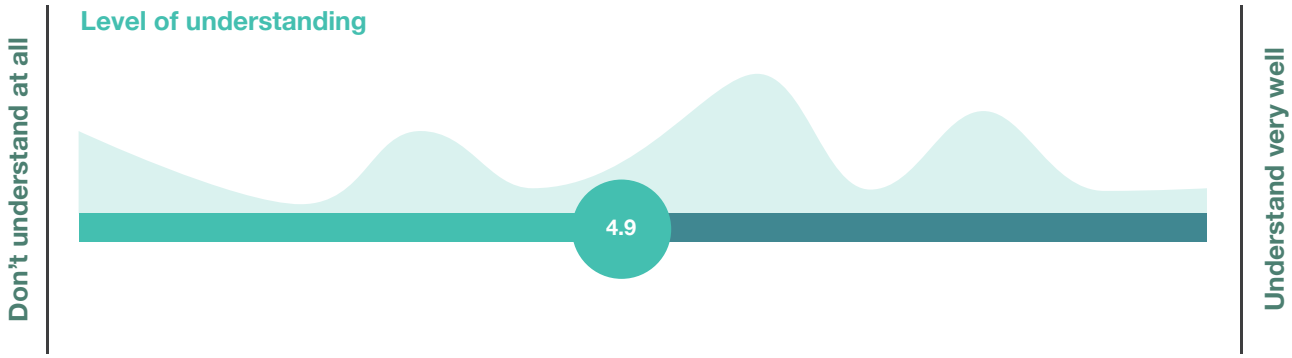
What do you want to get out of today?



How would you rate your level of engagement with WPD?



In your opinion, how well do you understand the relationship between National Grid FES, WPD DFES, and local area planning?



Stakeholder feedback

Inputs into the DFES process

The following tables present feedback from the webinars for all four licence areas, categorised by theme. This feedback was gathered through the responses to the live polls and interactive questions posed by the Regen team and via additional comments and questions submitted by stakeholders during the webinars. Every comment we received has been reviewed for the next stage of the scenario analysis.

Your comments to us	Our response
Theme: Ground mounted solar PV	
The majority of poll respondents thought the pipeline of new solar projects would begin connecting within the next three - five years, but some responses suggested the later 2020s.	In combination with solar developer engagement, we will use the polling responses from all four webinars to guide the logic and assumptions we apply to assessing the pipeline of solar PV projects. The four future energy scenarios should broadly reflect the range of possible timescales identified by respondents.
When asked why the East Midlands solar PV pipeline was particularly large, respondents identified the proximity to energy demand and lower cost of land as the most likely drivers.	We will consider these aspects as major distribution factors in the modelling. The distribution of solar PV uses Regen's in-house solar resource assessment, which accounts for these (and various other) factors.
You asked what proportion of pipeline projects typically get built, and how we account for this in the modelling.	We analyse previous projects that have either commissioned or failed in development, alongside conversations with current pipeline project developers, to guide the proportion of projects that go forward to connection under each scenario. We also use pipeline projects as a likely location of future development, even if a particular project doesn't come to fruition or has been identified as unsuccessful in planning.
You asked for more information on the reasons behind the increase in large scale solar PV pipeline projects.	We've seen a major increase in pipeline solar PV capacity over the last couple of years. Subsidy-free business models are becoming more feasible, and a move to more favourable conditions for developers as a result of falling panel prices, lower development costs and increasing yield efficiencies. The impact of the Targeted Charging Review and the fourth Contracts for Difference round including solar PV could also see further interest in developing solar capacity in various areas in the country.

Live results from the webinars

The figures in this section present the results from questions which were asked across the four webinars. Here, stakeholders were asked their thoughts on the current DFES assumptions around the large pipeline of large scale solar PV projects, particularly in the East and West Midlands.

Figure 2
South West licence area webinar responses regarding large scale solar PV.

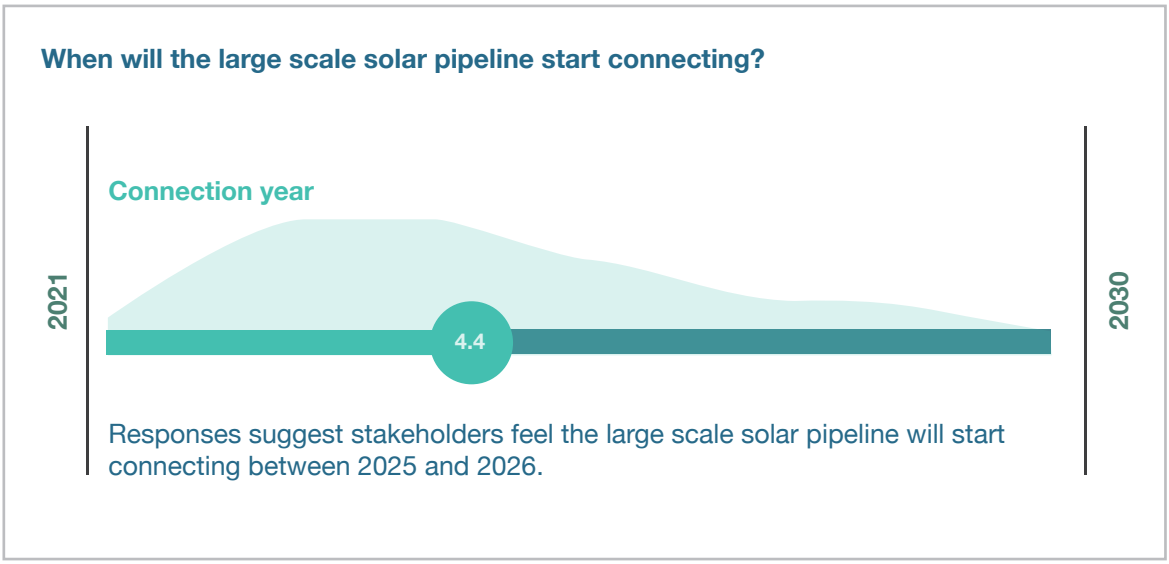
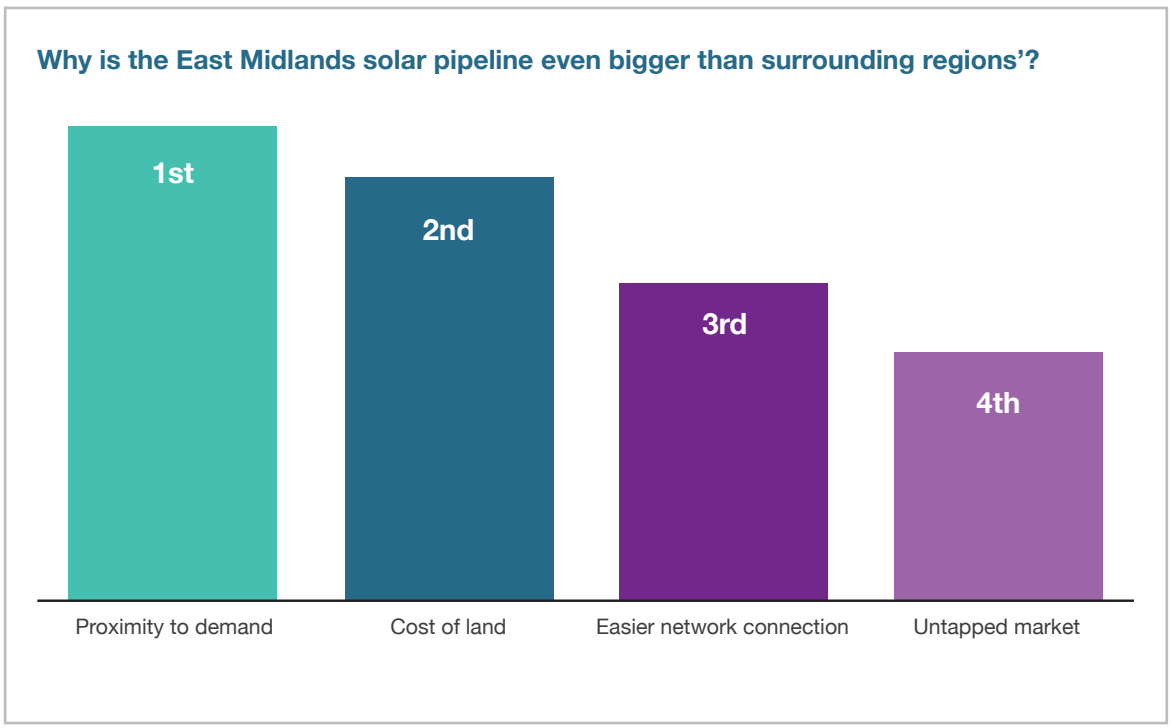
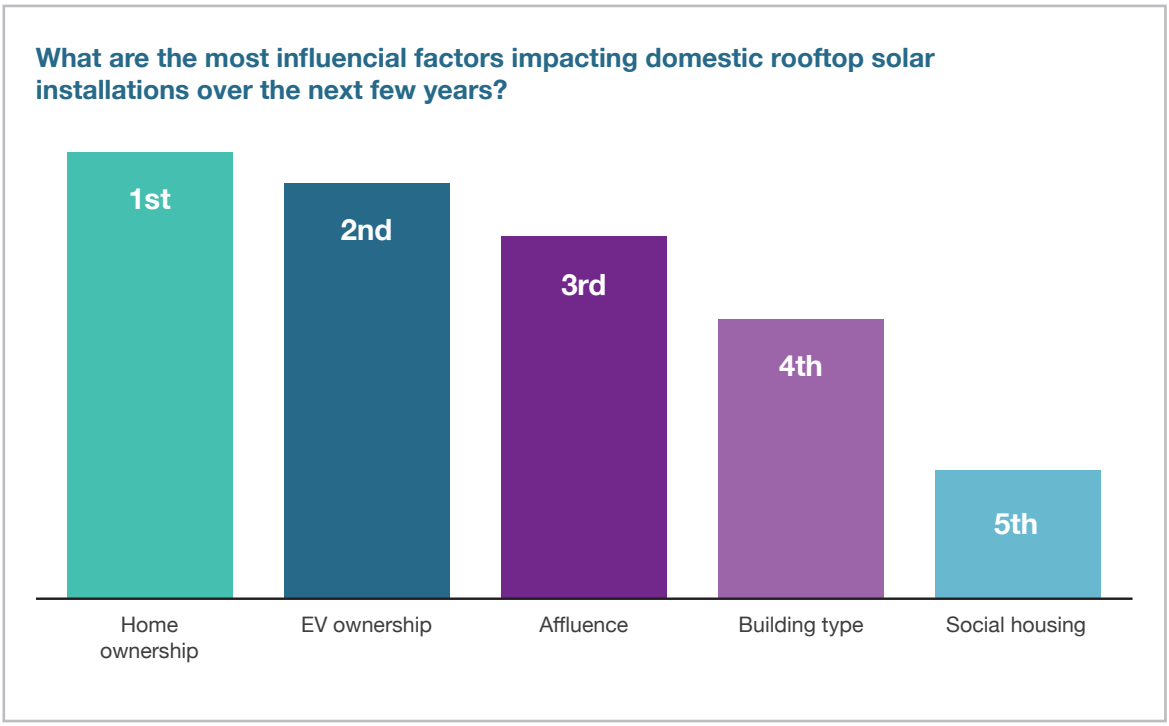


Figure 3
East Midlands licence area webinar responses regarding large scale solar PV.



Your comments to us	Our response
Theme: Rooftop solar PV	
Poll respondents identified home ownership, EV ownership and affluence as the key factors guiding rooftop solar installation over the next few years.	We will look to weight our rooftop solar distribution more towards these factors in the near term years of the analysis, for all four scenarios.
You noted that rooftop solar uptake is often influenced by planning regulations, especially in areas such as conservation zones.	We will continue to reflect conservation zones and other protected areas in the geographical distribution of rooftop solar PV and other domestic scale technologies.
You pointed out the potential for commercial rooftop PV to be deployed on more large commercial and industrial buildings such as warehouses.	When projecting the future distribution of rooftop PV across a licence area, our non-domestic rooftop PV modelling considers the amount of various property types, including warehousing and sheds.
You asked whether the potential reducing cost of domestic batteries in the future influences the uptake of domestic rooftop PV in our modelling.	Yes, the scenario framework assumes varying levels of complementary technology advancement and cost reduction of low carbon technologies. These work in tandem, with the scenarios with higher levels of domestic batteries also featuring higher levels of rooftop PV.

Figure 4
South West licence area webinar responses regarding rooftop solar PV.



Your comments to us	Our response
Theme: Onshore wind	
Respondents thought that onshore wind deployment is most likely to pick up in late 2020s in England, though a number of respondents thought the early-mid 2020s would be possible.	In addition to direct engagement with wind developers, we will use the answers from all four webinars to guide the pipeline and post-pipeline assessment of onshore wind projects. The four future energy scenarios used in the DFES should broadly reflect the range of possible timescales identified by respondents.
In South Wales specifically, respondents thought that onshore wind deployment would pick up sooner, between 2023 and 2027.	In addition to the above, we will also reflect this regional variation, as it is clearly evidenced by Welsh government policy.
The majority of respondents thought that subsidy-free wind farms will tend to be medium scale, i.e. between 10 and 50 MW, rather than either larger transmission network scale projects or smaller <10 MW wind projects.	We will model the onshore wind deployment in the scenarios on the assumption that a significant proportion will be medium scale, and in areas of greater potential wind resource.
You asked how we considered future repowering of existing wind farms in the DFES analysis.	We currently account for the repowering of onshore wind in a number of ways, depending on the scenario. This includes extending the life of existing turbines, increasing the capacity due to the use of larger turbines, or maintaining the same installed capacity but with fewer, larger turbines.

Figure 5
South West licence area webinar responses regarding onshore wind.

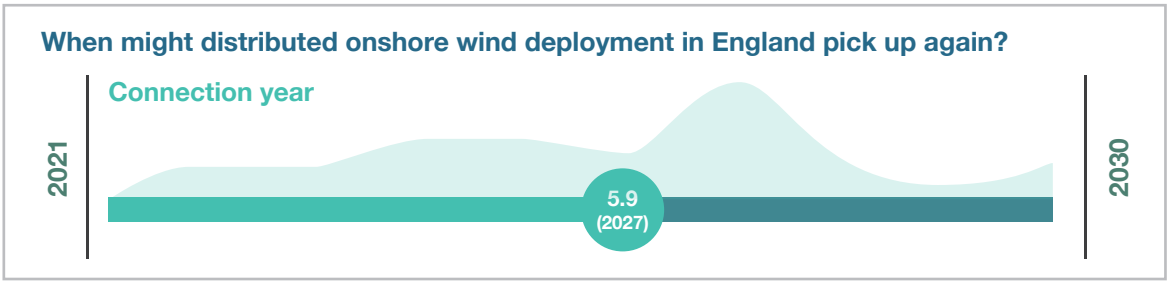
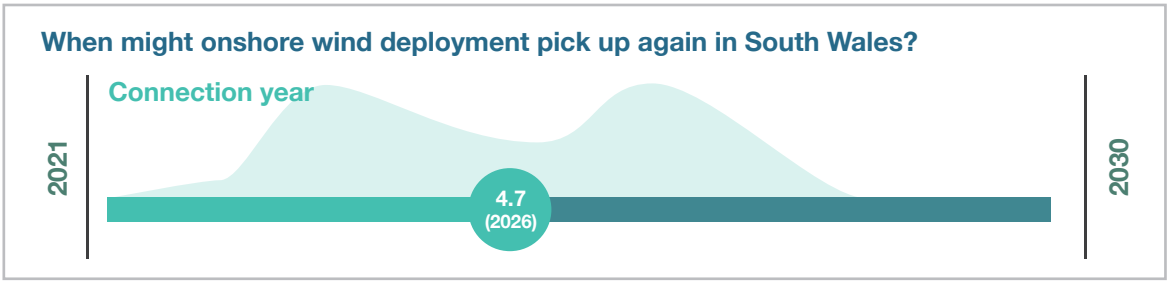
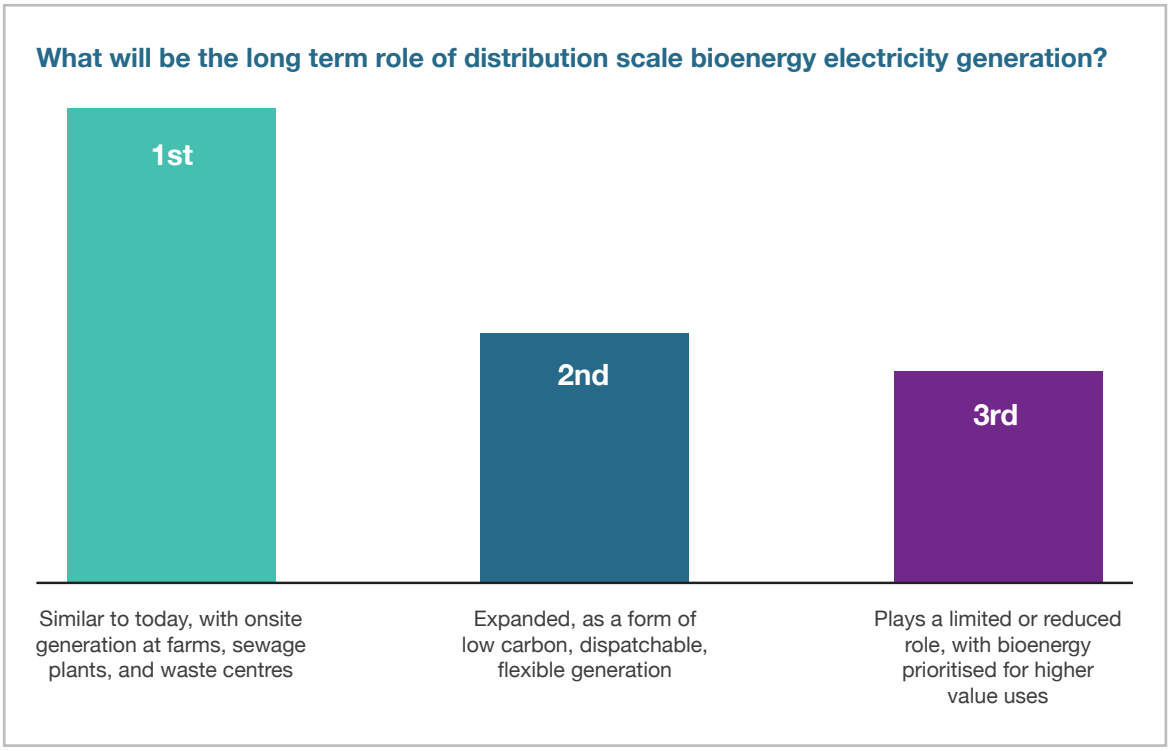


Figure 6
South Wales licence area webinar responses regarding onshore wind.



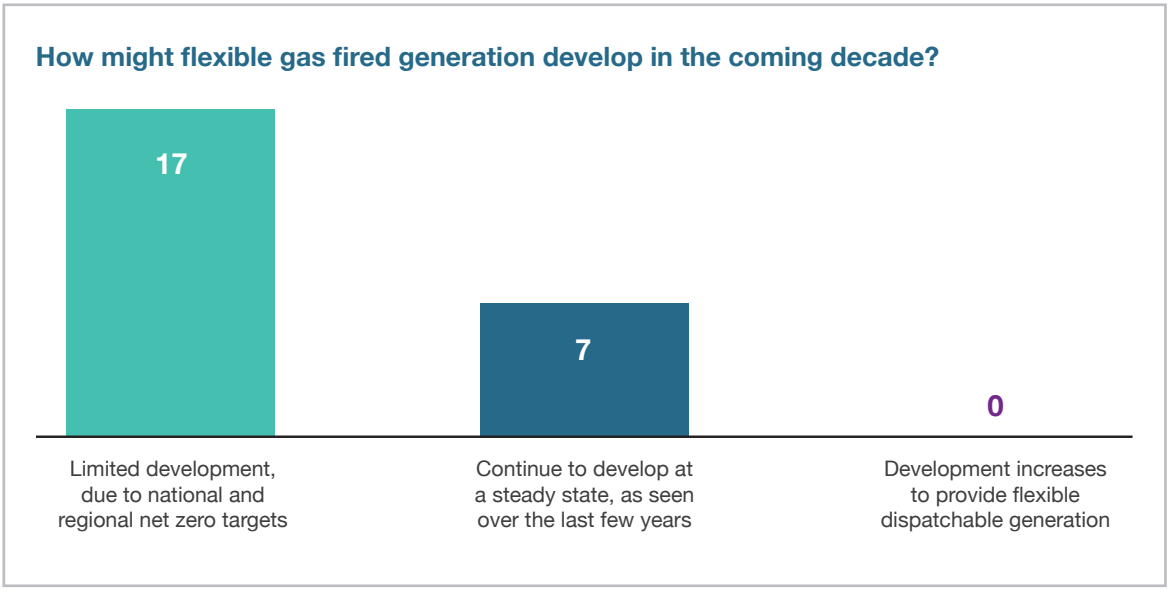
Your comments to us	Our response
Theme: Bioenergy	
Half of respondents thought that the role of bioenergy fuelled generation on the distribution network would remain similar to today. The remaining respondents were nearly evenly divided at whether it would see a reduced or expanded role.	We will look to replicate these views across the range of the four scenarios, especially the three net zero compliant scenarios that have a reliance on Bioenergy with Carbon Capture and Storage (BECCS).
Some stakeholders said that biomethane gas may be utilised for flexible power generation, similar to how fossil gas is used today.	We will model various forms of thermal and non-thermal generation replacing fossil fuelled electricity generation in the future scenarios, biomethane fuelled generation being one technology variant.

Figure 7
South West licence area webinar responses regarding bioenergy's role in the future energy scenarios.



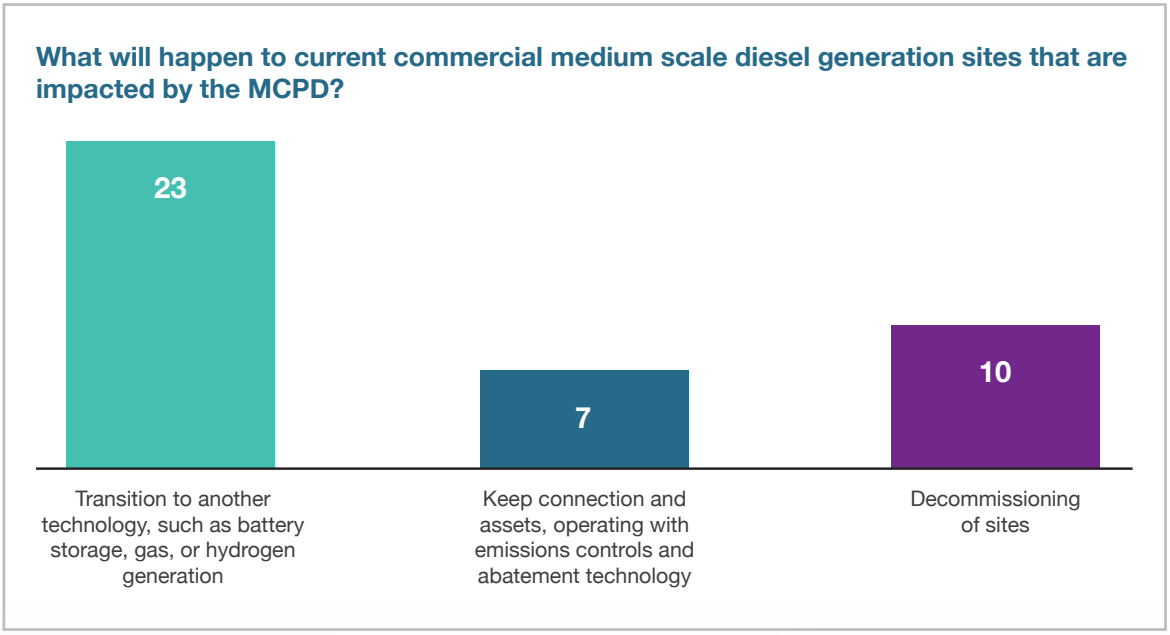
Your comments to us	Our response
Theme: Fossil gas fuelled generation	
A strong majority of respondents thought that flexible fossil gas fuelled generation will see limited development beyond the current pipeline, due to it being a fossil fuel.	We expect to see little to no unabated gas fuelled generation development beyond current pipeline projects in the three net zero compliant scenarios.
Poll respondents thought that the recent lifting of the National Grid 'Statement of Works' in South Wales could result in a surge of thermal and flexible generation projects in the 2020s, but that the impact is currently unclear.	We will continue to observe the impact on connection applications in South Wales, specifically that of fossil fuel generation and electricity storage, as technologies that were previously prevented from securing an export connection in the licence area.
You asked whether hydrogen could replace fossil gas as a fuel for peaking generation.	Hydrogen fuelled peaking plants are under the scope of the DFES analysis. There is significant uncertainty around the feasibility of using hydrogen for large amounts of power generation in the future. As a result, hydrogen fuelled peaking generation sees a wide range of outcomes across the future energy scenarios, reflecting this range of uncertainty.
You said that future development of fossil gas fuelled peaking plants could be limited due to their carbon intensity.	In the net zero scenarios we typically assume a much less favourable environment for high carbon technologies such as fossil gas fuelled peaking plants and it is likely that connected capacity will decline in these scenarios.

Figure 8
West Midlands licence area webinar responses regarding gas fuelled power generation.



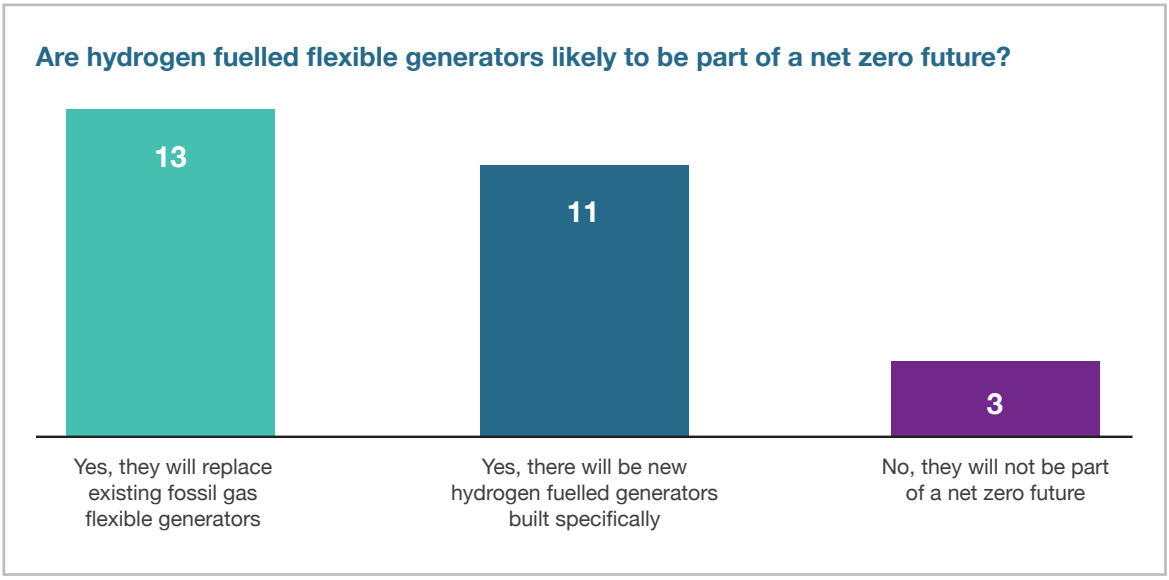
Your comments to us	Our response
Theme: Diesel fuelled generation	
The majority of respondents thought that diesel fuelled generation sites impacted by air quality regulations would transition to another technology. A significant minority thought the sites would simply fully decommission instead.	Existing diesel fuelled generation sites will be used as distribution factors for other technologies such as battery storage and hydrogen generation, where feasible.

Figure 9
South West licence area webinar responses regarding diesel fuelled power generation.



Your comments to us	Our response
Theme: Hydrogen fuelled generation	
Poll respondents agreed that hydrogen fuelled flexible generation was likely to be part of a net zero future, but were split on whether this would replace existing fossil gas fuelled generation, or whether hydrogen generation sites would be built from scratch.	We will model conversions of existing and pipeline fossil gas fuelled power generation sites where feasible. In scenarios where hydrogen is more abundant, new build hydrogen generation may also feature in more industrial areas of the licence areas.

Figure 10
South Wales licence area webinar responses regarding hydrogen fuelled power generation.



Your comments to us	Our response
Theme: Electricity storage	
Poll respondents felt that electricity storage co-located with generation will be the business model with the biggest increase in capacity, followed by standalone storage projects providing grid services. Domestic electricity storage was seen as having the least potential.	We will use existing and potential renewable generation sites as a key distribution factor for future electricity storage capacity, alongside the proximity to 33 kV and 132 kV network infrastructure.
In the East and West Midlands, a much higher proportion of respondents felt that high energy users, such as industrial customers, would drive electricity storage deployment in the near and medium term.	We will consider this regional variation in the modelling of battery storage for these licence areas.
You asked whether all baseline and pipeline storage sites were batteries.	Currently all baseline and pipeline electricity storage sites are solid-state batteries. However, future non-battery storage is also included in the scope of the DFES analysis, especially in the medium and longer term. We will consider the potential for non-battery storage out to 2050, especially in the scenarios where large scale storage is more prominent.
You asked whether there was much development of battery storage co-located with renewable energy generation.	There are a number of sites in WPD's licence areas and across the UK as a whole that are developing battery storage projects alongside renewable generation, either retrofitted on an existing solar or wind project, or being built alongside a new project. In the DFES modelling, we specifically model co-located storage as one of the four business models for energy storage, and as such renewable generation is a key factor in the location of future energy storage.
Some stakeholders pointed out that in a heavily decarbonised electricity grid energy storage providing system inertia could be another key revenue stream.	We are aware of these types of power quality services, and they are one of the factors and services that underpins the 'Standalone Grid Services' business model. We accept that other business models may also have this as a use-case and revenue stream.
Respondents thought that flow batteries and power-to-X were the most likely alternative storage technologies to solid-state batteries, to deploy on the distribution network.	We will consider these technologies, in alignment with the scenarios, as potential alternative technologies that will potentially be connected out to 2050.
Further forms of non-battery energy storage, such as molten salts, were mentioned.	We will make sure to assess all potentially viable distribution scale storage technologies in the scenario projections.

Figure 11
South West licence area webinar responses regarding electricity storage business models.

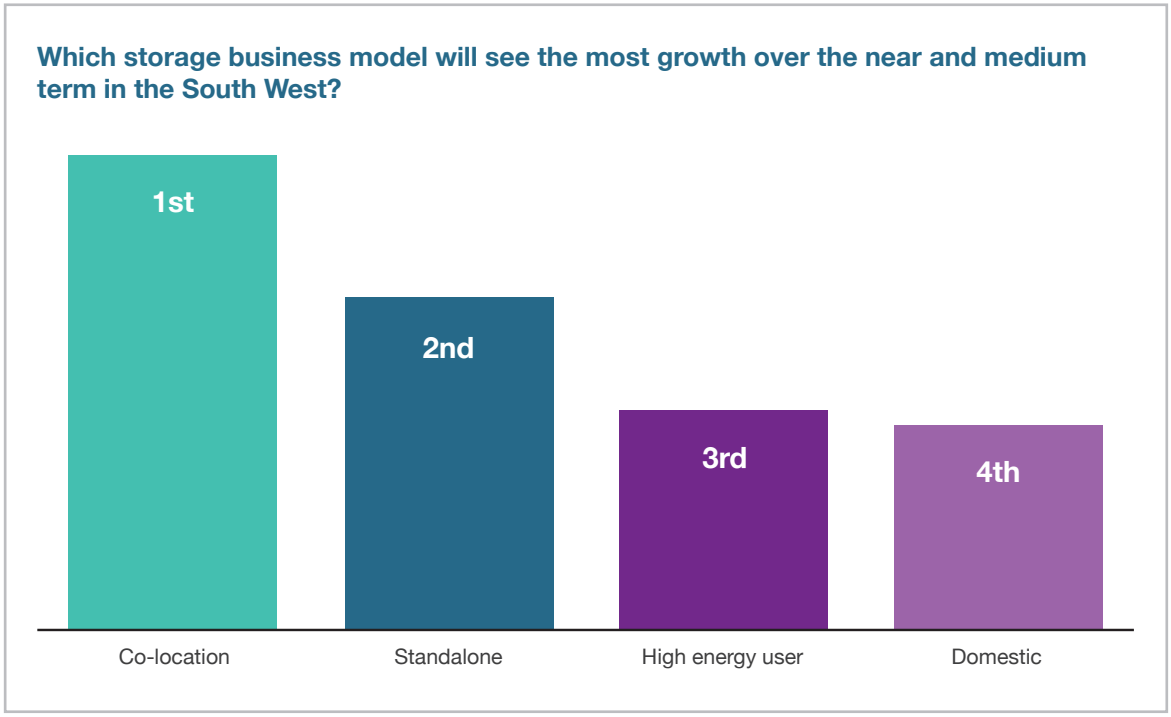
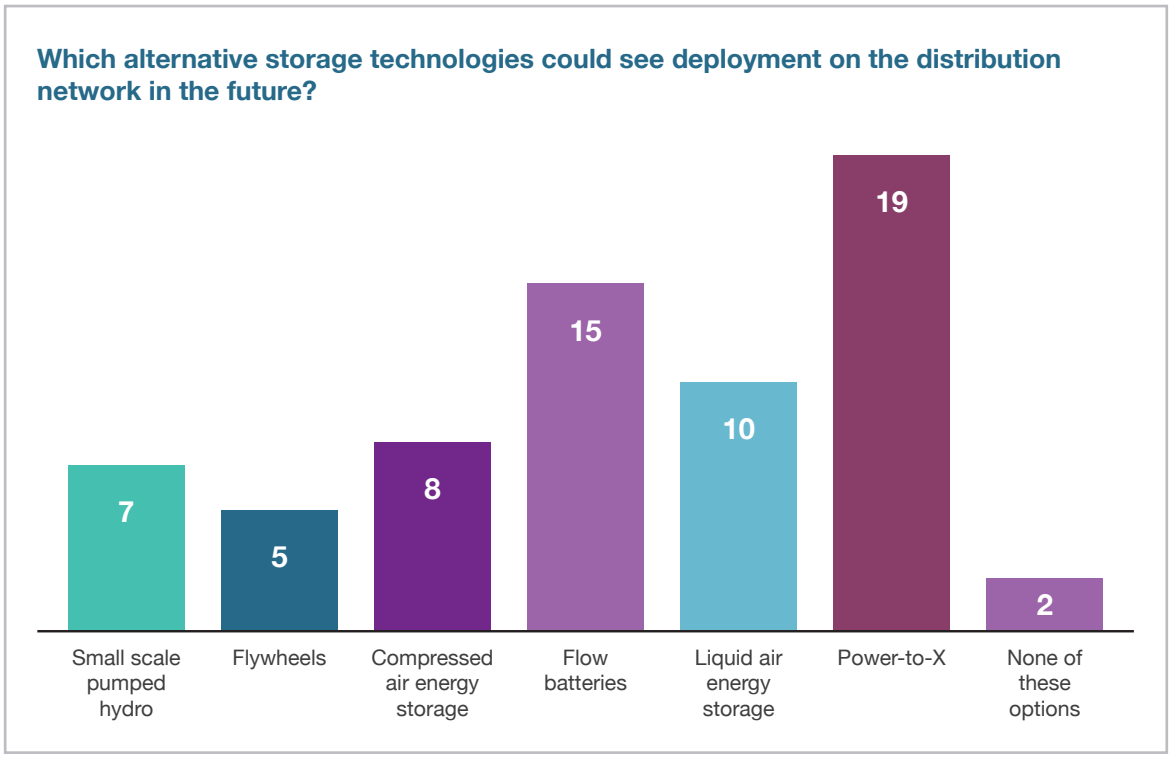
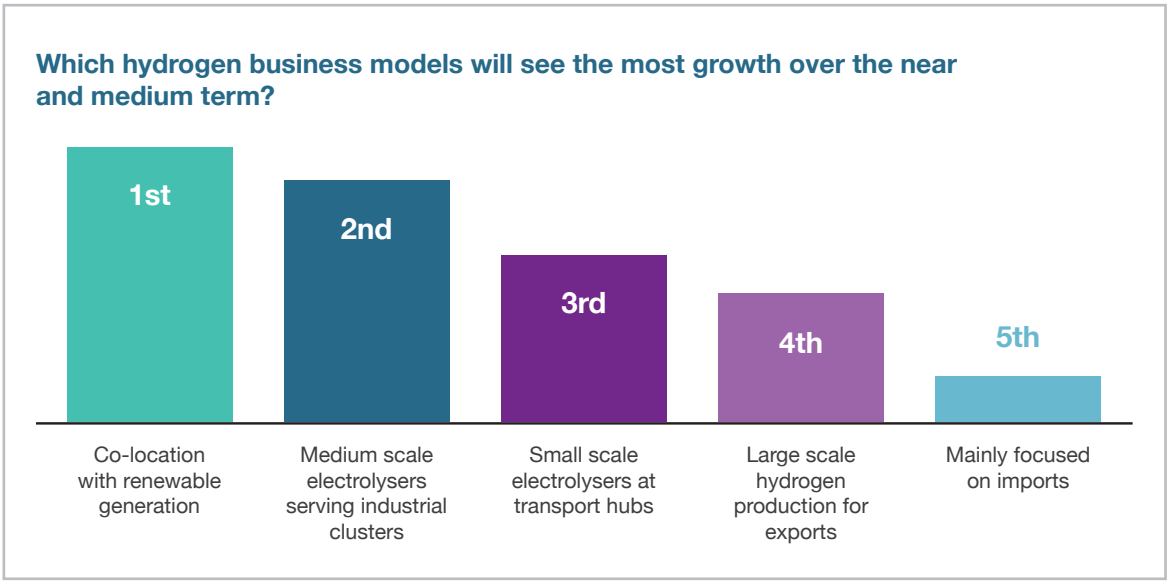


Figure 12
West Midlands licence area webinar responses regarding alternative electricity storage technologies.



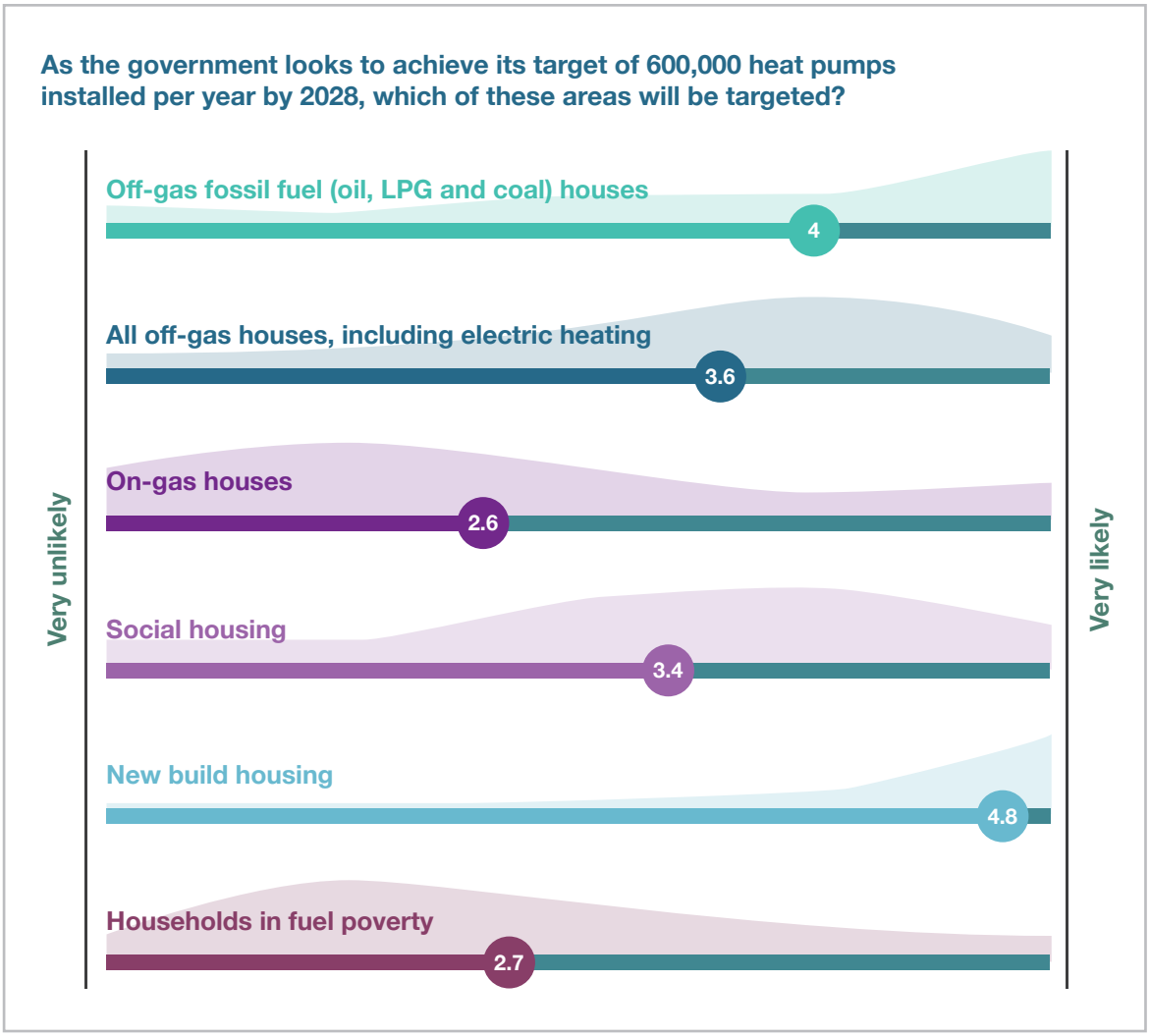
Your comments to us	Our response
Theme: Hydrogen electrolysis	
Most poll respondents felt that hydrogen electrolysis would be used as a low carbon alternative to existing hydrogen production. It was felt that hydrogen from zero carbon electrolysis could be used as a transport fuel for larger vehicles. A significant proportion of respondents also thought it could be used for heating through hybrid heat pumps, industrial processes and electricity generation.	The role of hydrogen in the scenarios is a multi faceted and complex issue. The volume of hydrogen used has a large range across the scenarios. The wide range of potential use cases suggested by respondents reflects the wide range of hydrogen scenarios, and will be accounted for in the DFES analysis.
Respondents expected co-location with renewables and serving industrial clusters to be the main business models for hydrogen electrolysis in the near and medium term. Small scale electrolysers serving transport hubs were also seen as likely to see growth, especially in the East Midlands licence area.	We will use these results to guide the distribution of hydrogen electrolysis capacity in the scenarios, both across all four licence areas and in individual regions where transport hubs, industrial centres and larger scale renewables are more prominent.
Poll respondents noted that the production, delivery and usage of hydrogen in various sectors is currently highly uncertain, and asked how this would be considered in the analysis.	The applications of hydrogen in the future energy scenarios are wide ranging, from very little in a highly electrified future scenario to a hydrogen economy style scenario. The uncertainty behind hydrogen in almost all of its potential use cases drives this wide array of scenario outcomes.

Figure 13
South Wales licence area webinar responses regarding hydrogen electrolysis business models.



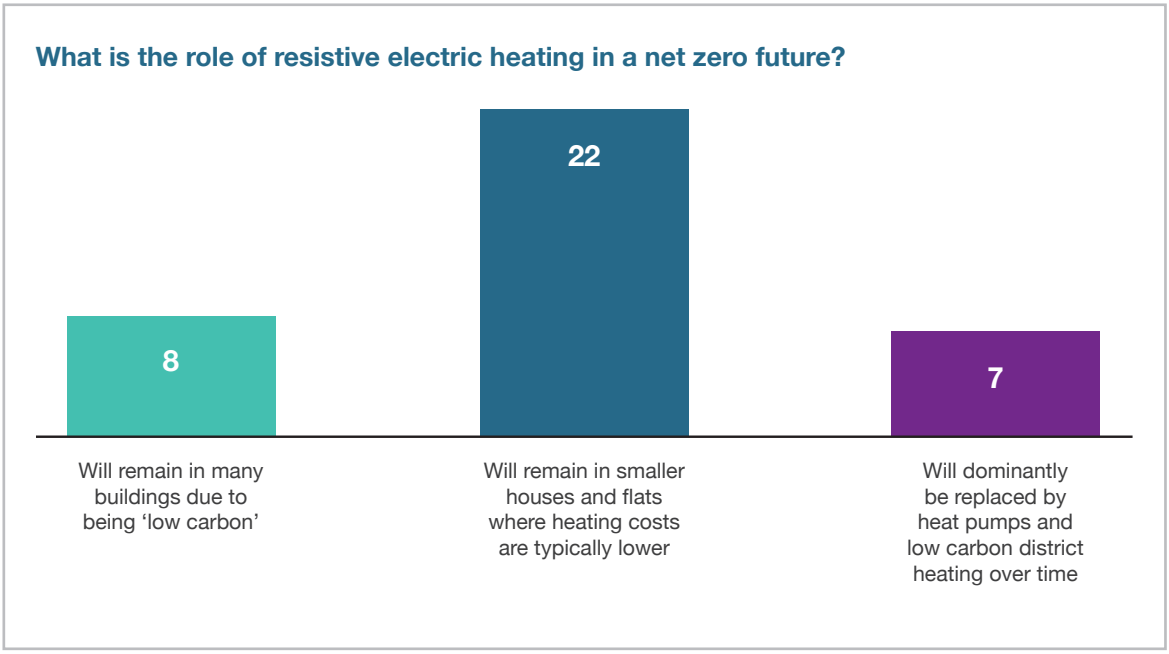
Your comments to us	Our response
Theme: Heat pumps	
Poll respondents thought that off-gas fossil fuel heated homes and new build homes would be most strongly targeted for heat pump deployment over the next decade, with on-gas homes and households in fuel poverty the least targeted. However, all options were considered likely to be targeted to some degree.	We will use these factors in the distribution of heat pumps between the baseline and 2028, considering current heating technologies, fuel access and demographic factors for each licence area.
You noted that WPD may not have sight of all installed heat pumps.	We construct a baseline of low carbon technologies such as heat pumps from an array of sources, including WPD data, RHI data and Energy Performance Certificates. We believe this yields an accurate baseline, however there may be heat pumps left unidentified.
You asked whether hybrid heat pumps are included in the analysis.	Yes - hybrid heat pumps are a technology in the DFES scope, with a wide range of outcomes depending on the scenario.
You asked whether thermal storage was considered in the analysis.	Yes - thermal storage has been added to the DFES scope this year, as it could play a significant role in the electrification of domestic heat, and has substantial ramifications for network planning.
It was noted that the condition of the building stock is likely to play a significant role in the uptake of heat pumps in the near term, with local authorities encouraged to tackle the worst performing stock via whole house retrofit.	We will look to model heat pump uptake across all types of housing, including installation alongside energy efficiency retrofit in poorly insulated housing. We also consider fuel poverty as a significant factor in the geographical distribution of heat pumps in the near and medium term.
You asked whether new build housing would be designed to avoid the need for significant space heating.	As it stands, the Future Homes Standard would not achieve levels of efficiency akin to the Passivhaus standard, where space heating demand is minimised. As a result, we model new build housing as still requiring a form of space heating, especially in medium term.
Some stakeholders disagreed on the level of insulation required for a heat pump to be installed and run effectively. The various heat pump options, such as ground source heat pumps on an ambient loop, were mentioned.	We will continue to engage with the heat and buildings industry to ensure our assumptions around heat pump roll out are realistic. This year, we are modelling seven different types of heat pump heating technologies, reflecting the various use cases of different heat pump technologies, potentially combined with thermal storage.

Figure 14
West Midlands licence area webinar responses regarding domestic heat pumps locations.



Your comments to us	Our response
Theme: Electric heating	
In the South West, poll respondents felt that resistive electric heating was most likely to remain in smaller houses and flats in the net zero future, rather than being replaced by heat pumps.	We will model resistive electric heating based on housing stock, existing heat technology and location, particularly accounting for the potential for district heating in urban rather than rural areas.
In the West Midlands, where levels of electric heating are particularly high, most poll respondents thought that resistive electric heating would be replaced with heat pumps and district heating over time.	
You said that re-weighting carbon levies from electricity bills to gas bills would significantly reduce the cost of resistive electric heating.	We will consider this potential change and policy driver in our near medium term uptake modelling for both resistive electric heating and heat pumps.

Figure 15
South West licence area webinar responses regarding the role of resistive electric heating.



Your comments to us	Our response
Theme: Electric vehicles (EVs)	
Respondents were fairly evenly split on the future of electric vehicle charging for on-street parked vehicles.	Without a clear consensus at this point, we will continue to project a blend of public charging solutions across all four scenarios.
Respondents thought the EV uptake in South Wales was behind the UK average rate primarily due to the cost of EVs and relative lack of charging infrastructure.	We will use these two factors as key metrics for the uptake of EVs in the near term in the modelling.
Respondents in the East Midlands identified the greater charging infrastructure and company fleet conversions as the main reasons for current EV uptake in the licence area to be ahead of the national average.	We will continue to tie existing infrastructure and fleet conversions in the EV modelling in the near term.
You asked whether vehicle-to-grid, or V2G, was considered in the scenarios, especially given the potential grid balancing capabilities.	V2G is not currently modelled as part of the DFES process, however, the detailed modelling of electric vehicle and charger uptake should facilitate V2G modelling in the future based on the DFES data. V2G may also be a technology that we look to incorporate into the DFES analysis more directly in the future.

Figure 16
South Wales licence area webinar responses regarding on-street parked EV charging.

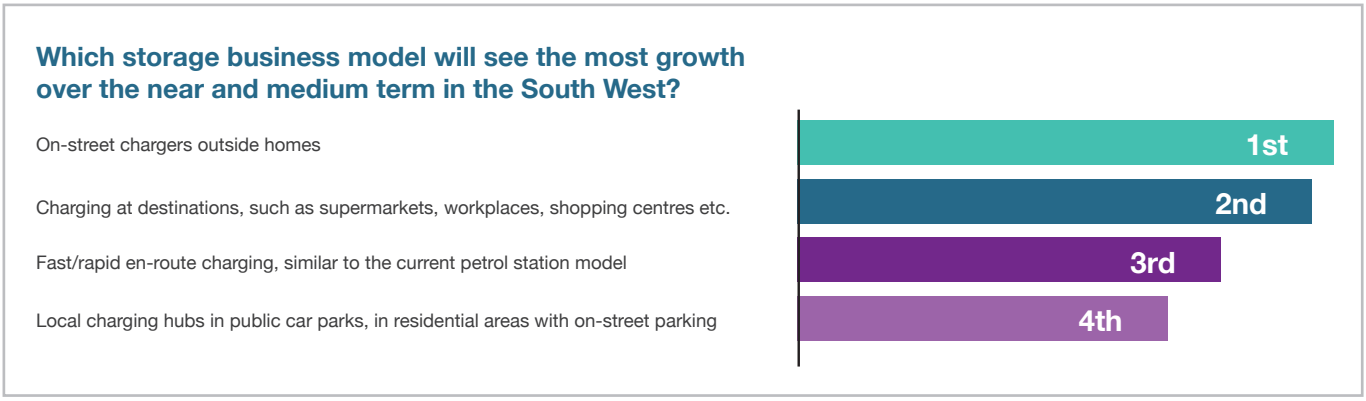
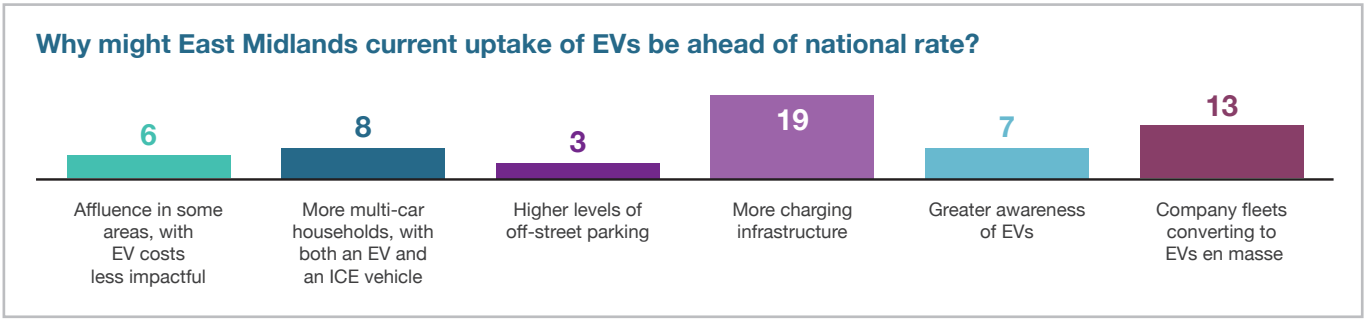
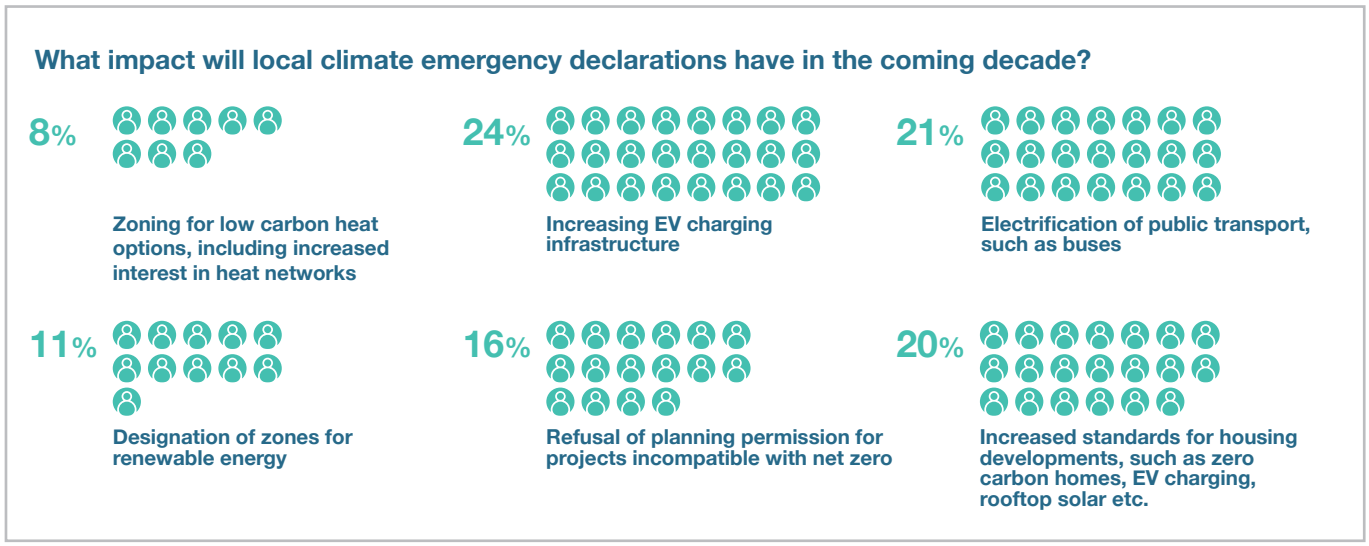


Figure 17
East Midlands licence area webinar responses regarding current EV uptake.



Your comments to us	Our response
Theme: Local authorities and new developments	
When asked for the single main potential impact of local climate emergency declarations, the majority of respondents thought that increased standards for new housing developments would be the biggest impact.	We will put some focus on the geographical distribution of technologies such as heat pumps, EV chargers, rooftop PV etc. towards new developments, especially those in areas with climate ambitions.
When asked for all possible impacts of local climate emergency declarations, poll respondents felt that increased EV charging infrastructure, electrification of public transport, refusal of planning permissions for fossil fuel projects and increased new build housing standards could all be impacted.	We will use climate declaration data as a factor in our assessment of fossil fuel pipeline projects and transport modelling in the near and medium term.
You asked whether the scenarios reflected more ambitious net zero targets set by local authorities, such as 2030 and 2035 ambitions.	We don't specifically model every local authority achieving these ambitions, as these would be better reflected through the Local Area Energy Planning process. However, local authorities with greater climate ambition, especially those with specific strategies for low carbon heat, transport or generation, will see higher levels of low carbon technology deployment in the projections.
There was some disagreement between stakeholders as to the impact of the Future Homes Standard, with some expecting delayed implementation, while others already seeing a move to heat pumps in long-term development projects.	At the moment, our understanding and subsequent modelling expects the Future Homes Standard and associated ban on new gas connections to come into force in 2025 in most scenarios.

Figure 18
East Midlands licence area webinar responses regarding the impact of local climate emergency declarations.

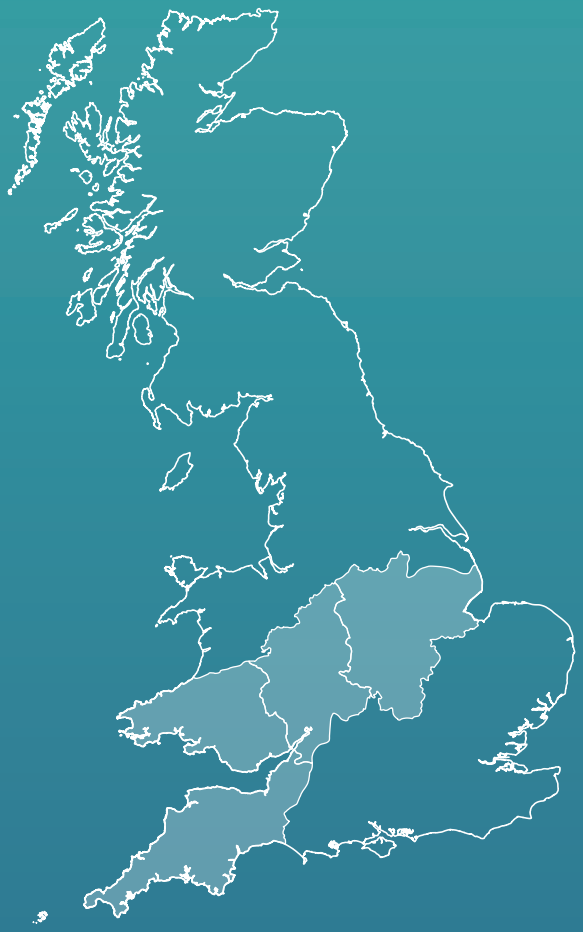


Your comments to us	Our response
Theme: DFES	
You asked whether future policies and changes to planning, such as the Future Homes Standard, were considered in the modelling.	We integrate future policies in the scenario modelling. Depending on the level of certainty and detail around the proposed policy, it may go ahead in all, or only some, scenarios.
You asked whether the modelling would account for areas where the grid is constrained, and connection offers are harder to obtain.	Our modelling does not only rely on projects currently in development; we also complete our own independent resource assessments for various technologies and ensure that areas/regions with undeveloped potential are included in scenarios where more ambitious development is appropriate. This ensures that more constrained areas of the grid are not excluded in terms of future development.

Your comments to us	Our response
Theme: WPD network	
You asked what the process is to engage and discuss projects with WPD.	Getting access to WPD staff to support optioneering has a few different focuses - the link below outlines some of the surgery routes: www.westernpower.co.uk/connections-landing/surgery-appointments
You asked how network upgrade costs are calculated and whether this methodology was available.	The Common Distribution Charging Methodology (CDCM) model is used to apportion charges across the network. The CDCM models have unit costs at the various voltage levels, which provides an illustrative £/kW/yr cost assumption. There are more details on the following webpage: www.westernpower.co.uk/our-network/use-of-system-charges/charging-statements
You asked whether WPD were planning any pre-emptive, large scale network reinforcements in constrained areas, particularly where local ambition exceeds projected network capacity. You also asked how the costs of connection and network upgrades for smaller scale technologies, such as heat pumps and EV chargers, are funded.	WPD see the next price control as being a much better enabler of strategic investment and Ofgem are keen to develop a working model of governance, whereby transmission, distribution, gas and electricity networks all work together to optimally design the future energy system with strategic input and decision making being provided national government. Our Business Plan explains our proposed approach in more detail: yourpowerfuture.westernpower.co.uk/riioed2-business-plan

WESTERN POWER DISTRIBUTION

Serving the Midlands, South West and Wales



Western Power Distribution (East Midlands) plc, No2366923
Western Power Distribution (West Midlands) plc, No3600574
Western Power Distribution (South West) plc, No2366894
Western Power Distribution (South Wales) plc, No2366985

Registered in England and Wales
Registered Office: Avonbank, Feeder Road, Bristol BS2 0TB

www.westernpower.co.uk

@wpduk